AMENDMENTS TO THE CLAIMS

1. (Currently amended) A method of detecting an explosive material or composition, comprising:

irradiating a sample comprising an object surrounded by a surrounding material with an optically-generated pulse of electromagnetic radiation, said pulse having a plurality of frequencies in the range from 100 GHz to 100 THz;

detecting radiation transmitted and/or reflected from the object;

adjusting the detected radiation signal to compensate for the effect of the surrounding material;

differentiating the signal of the detected radiation to compensate for the effect of the surrounding material; and

identifying one or more features of the detected radiation which are indicative of a known explosive material or composition.

2. (Currently amended) A method of detecting an explosive material, comprising:

irradiating a sample comprising an object surrounded by a surrounding material with an optically-generated beam of substantially continuous electromagnetic radiation having a frequency in the range 100 GHz to 100 THz;

detecting radiation transmitted and/or reflected from the object;

adjusting the detected radiation signal to compensate for the effect of the surrounding material;

differentiating the signal of the detected radiation to compensate for the effect of the surrounding material; and

identifying one or more features of the detected radiation which are indicative of a known explosive material or composition.

3. (Previously presented) The method of claim 1 wherein the identification of one or more feature comprises determining whether the detected radiation is indicative of a fundamental property of one or more explosive materials/compositions.

4. (Previously presented) The method of claim 1 wherein the analysis of the detected radiation comprises determining a frequency spectrum from the detected radiation.

5. (Original) The method of claim 2 wherein the analysis of the detected radiation comprises obtaining a frequency spectrum at a number of predetermined frequencies and analysing the spectra at the predetermined frequencies to determine if features of known explosive materials are present.

Claims 6-29. (Canceled)

30. (Previously presented) The method of claim 4 further comprising analysing the frequency spectrum at predetermined frequencies to determine if features of known explosive materials/compositions are present.

31. (Previously presented) The method of claim 5 wherein the analysis comprises comparing the spectral intensity of the predetermined frequencies with expected intensities relating to one or more explosive materials/compositions.

32. (Previously presented) The method of claim 5 wherein the analysis comprises calculating at least one ratio of spectral intensity at first and second predetermined frequencies and comparing with expected intensity ratios relating to one or more explosive materials.

33. (Previously presented) The method of claim 32 wherein a plurality of intensity ratios are calculated for the spectral signature from a predetermined set of frequencies and are compared with expected intensity rations relating to one or more explosive materials.

34. (Previously presented) The method of claim 1, further comprising obtaining a first derivative of the obtained spectra.

35. (Previously presented) The method of claim 5 wherein at least one of the predetermined frequencies correspond to a region of low water absorption.

36. (Previously presented) The method of claim 1 further comprising applying a measure to reduce water absorption effects in the detected radiation.

37. (Previously presented) The method of claim 36 wherein the effects of water absorption are reduced by reducing the resolution in the analysis of the detected radiation.

38. (Previously presented) The method of claim 1 wherein said explosive material or composition is covered with a member, said method further comprising compensating for the signal due to the member by differentiating the detected radiation.

39. (Previously presented) The method of claim 38 wherein the signal is compensated for by obtaining the first derivative of a frequency spectrum of the detected radiation.

40. (Previously presented) The method of claim 1, wherein the analysis comprises:

obtaining a measure relating to the time-of-flight of the detected radiation reflected off a rear surface of the object;

obtaining a measure relating to the absorption of the objection from the time-of-flight measure;

determining whether the object is an explosive material from the absorption measure.

41. (Previously presented) The method of claim 2, further comprising:

determining whether a reference beam at the detector is in phase with the detected radiation; and

adjusting the detected radiation by at most ½ a period to achieve an in-phase.

42. (Currently amended) An explosive detection apparatus, comprising:

an optically-driven emitter for irradiating a sample comprising an object surrounded by a surrounding material with a beam of substantially continuous electromagnetic radiation having a frequency in the range 100 GHz to 100 THz;

means for detecting radiation transmitted and/or reflected from the object,

analyser for adjusting and differentiating the detected radiation signal to compensate for the effect of the surrounding material and to determine if one or more predetermined features of an explosive material exists.

43. (Currently amended) An explosive detection apparatus, comprising:

an optically-driven emitter for irradiating a sample comprising an object surrounded by a surrounding material with a pulse of electromagnetic radiation, said pulse having a plurality of frequencies in the range from 100 GHz to 100 THz;

means for detecting radiation transmitted and/or reflected from the object;

analyser for adjusting and differentiating the detected radiation signal to compensate for the effect of the surrounding material and to determine if one or more predetermined features of an explosive material exists.

44. (Previously Presented) The apparatus of claim 42 wherein the analyser calculates a frequency spectrum from the detected radiation, and the apparatus further comprises a comparator for comparing the calculated spectrum with one or more known spectra of explosive materials/compositions to determine whether a likeness exists.